

## PREVALENCE OF HEPATITIS B , HEPATITIS C AND VDRL IN BLOOD DONORS IN TERTIARY CARE HOSPITAL IN WESTERN INDIA

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### ABSTRACT:

**Background:** Safe blood and blood products should be offered to all patients in need for blood transfusion. The objectives of this study were to ascertain prevalence estimates for hepatitis B, hepatitis C and VDRL infection as a foundation for safe blood transfusion in Jhalawar district in Rajasthan state in western India. **Material and Methods:** A retrospective study was conducted in blood bank, S.R.G. Hospital, Jhalawar-district, Rajasthan (Western India) from January 2013 to December 2014. A total of 25,836 blood samples of blood donors were tested by an enzyme linked Immunoassay technique (ELISA) for detection of hepatitis B surface antigen (HBsAg), antibodies to hepatitis C antigen (anti-HCV) & VDRL was tested by Rapid Plasma Reagin technique. The Elisa test outcome in hepatitis was crosschecked by Rapid Card test twice with two different manufacturing companies. **Results:** The prevalence of HBsAg was 1.98%, anti-HCV was 0.20% and VDRL was 0.33% respectively. The prevalence being higher in males as compared to females. **Conclusion:** Prevalence of hepatitis B, C and VDRL increased over a period of time.

**Key Words :** Seroprevalence, HBSAg, HCV, Syphilis, Voluntary, Replacement Blood Donors.

### INTRODUCTION

Hepatitis B virus (HBV) is one of the most common cause for chronic liver disease (CLD) in the developing countries. The virus is known to be highly infective and is associated with morbidity and mortality due to complications like cirrhosis, portal hypertension, and hepatocellular carcinoma (HCC). Prevalence of hepatitis B surface antigen (HBSAg) in India varies from 1 to 13 percent, with an average of 4.7 percent. (1-6)

Only continuous improvement in donor selection, sensitive screening tests and effective inactivation procedures can ensure the elimination or at least reduction of risk acquiring TTIs. (7)

India is the second most populous nation in the world. The Indian subcontinent is classified as an intermediate hepatitis B virus (HBV) endemic zone and has the second largest global pool of chronic HBV infections.

A study by Pahuja et al in 2007 discovered disquieting high seroprevalence of HBsAg, anti-HCV (2.23%,0.6% respectively) among blood donors of a metropolitan city like Delhi.(8)

We report the seroprevalence of hepatitis B(HBV),hepatitis C (HCV) and VDRL over a period of 2 years from January 2013 to December 2014 in a tertiary care hospital based study.

### MATERIAL AND METHODS

Duration of study was from January 2013 to December 2014. All blood donors ( including voluntary and replacement blood donors) coming to donate blood either at blood bank, S.R.G. Hospital, Jhalawar (Rajasthan) as well as at various blood donation drives organized by blood bank were included in this study.

25,836 serum samples from Replacement and Voluntary donors were tested for prevalence of markers for TTIs viz. HBsAg, HCV and RPR for Syphilis.

Hepatitis B surface antigen (HBsAg) was tested by 3<sup>rd</sup> generation ELISA, Hepatitis C virus was tested by 3<sup>rd</sup> generation ELISA methods using NACO approved commercially available kits. Screening for syphilis was done by Rapid Plasma Reagin (RPR) method.

Donors were selected by taking complete history, clinical examination ( strictly following donor's selection criteria) to eliminate professional donors and including donors who gave voluntary written consent for screening of their blood for TTIs. A detailed pre-donation questionnaire was included in donor registration form. Information

regarding risk factors like history of surgery, previous illness, hospitalization, blood transfusion, occupation, high risk behaviour and tattoo marks was collected. All the reactive samples were repeat tested before labeling them seropositive and respective blood units were discarded as per standard protocols.

### RESULTS

A total of 25,836 apparently healthy adult donors were screened during the study period. Among them 17,938(69.4%) were voluntary blood donors and 7,898 (30.5%) were replacement donors. Table 1 shows the gender distribution in both donor groups.

The disturbing trend here is a gradual and steady increase in the positivity rate of HBsAg, HCV and RPR in blood donors from year 2013 to 2014.This might be reflective of asymptomatic cases of Hepatitis B in the society and may need attention from health authorities and may be reflective of changing life style and more open social norms even.

The seroprevalence of HBV, HCV and syphilis was found to be 0.95%,0.11% and 0.14% respectively in voluntary blood donors as against the figures of 0.99%,0.19% and 0.15% being the seroprevalence of HBV,HCV and syphilis in replacement donors.

Females comprised of only 18% in voluntary blood donor group and 16% in replacement blood donor group. Hence male and female donors of both groups were included to find out % seroprevalence of TTIs for the purpose of valid and meaningful statistical analysis

Comparison our data, it seems that all the viral markers were more or less correlating with the data from various studies carried out at various centers in Delhi, Ludhiana, Haryana, U.P., West Bengal and Bangalore. Our study reveals an average overall prevalence of HCV antibodies in Blood Donors serum as being 0.15 % (about 0.12% in 2013 to a increase of 0.18% in 2014 ) which is significantly lower than other regions of India. The reason for this may be either a particular geographical distribution or declining rate of HCV positivity in healthy population. The wide variations of HCV seroprevalence in different studies in India might be due to the use of different generation of ELISA test kits, having different sensitivities and specificities. Various studies have reported an international HCV prevalence range of 0.42-1.2%.

## DISCUSSION :

TTIs continue to be a big threat to the safety of blood supply more so in developing and under developed countries.(9) Viral infections are the major cause of morbidity and mortality in blood recipients.(10) In this study in North India we found overall sero-prevalence of 0.84% of TTIs among healthy blood donors. The trend of seropositivity increased from 0.71% to 0.87% over period of time from 2013 to 2014; might be due to change in life style and open social norms here.

Among these, highest prevalence was for hepatitis B(1.94%); and this prevalence-rate was high even as compared to 0.87% which was found in Jaipur, Rajasthan.(11). Different studies stated that sero-prevalence of hepatitis B among blood donors was higher than HIV, HCV and syphilis.(11,12,13,14,15)

Most common viral hepatitis next to Hepatitis B is Hepatitis C. In this study the seroprevalence for hepatitis C was 0.29% which is quite low as compared to other studies.(16,17,18)

Higher prevalence levels for HBsAg were found in remote rural areas as compared with the less remote areas; might be due to repeat use of needles by quacks here. Improper disposal of hospital wastes is one of the most common contributing factors associated with the spread of hepatitis C .

TTIs contribute a definite and serious complication of blood transfusion even with non-remunerated so called “ safe blood donors” .Taking into account the higher seropositivity among replacement donors, there should be motivation of public for voluntary donation and directed donation should be discouraged. As the enormity of Hepatitis B is more than HCV antibody screening should be routinely done. In spite of all testing the risk of disease transmission through blood cannot be declined to zero due to lack of investigations which are 100% sensitive, difficulty in adopting the high sensitive test like DNA hybridization and PCR for bulk use, failure to detect those donors who are in the window period and also the potential for novel infectious agents. The increased testing will also result in loss of some safe donors due to false positivity and additional expense of testing to the patient.

The present study highlighted serious concerns regarding the safety of the blood supply still after donor screening for HBsAg. Medical and nursing schools must provide proper knowledge

about the disease and emphasize on quality practice. WHO has rated Pakistan as 2<sup>nd</sup> Country in the world having high rates of chronic infections mainly attributed to unsafe injection using contaminated equipment.

## CONCLUSION

It is apparent from the results of present study, higher Incidence of Transfusion Transmissible infections have been observed among Replacement donors compared to Voluntary donors. Our study is comparable to other studies carried out in India. Efforts should be made to increase the number of voluntary donors and reduce replacement donations to a minimum.

The major concern in transfusion services today is increased seropositivity among Replacement Donors for HBsAg, HCV and syphilis. With the advent of nucleic acid amplification techniques (NAT), western countries have decreased the risk of TTI to a major extent. But the cost-effectiveness of NAT is poor. The NAT has added benefits but its high financial cost is of concern, especially in underdeveloped countries like India. Apart from NAT for donor screening, other factors such as public awareness, vigilance of errors, educational and motivational programs is sure to help in decreasing the infections.

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## REFERENCES:

1. S.P.Thyagarajan, S.Jayaram, and B.Mohanavalli, "Prevalence of HBV in general population of India," in Hepatitis B in India: Problems and Prevention, S.K.Sarin and A.K.Singhal,Eds.,pp.5-16,CBS, New Delhi,India,1996.
2. R.C.Jain, S.D.Bhat, and S. Sangle, "Prevalence of hepatitis surface antigen among rural population of Loni area in Ahmednagar district of Western Maharashtra," The Journal of the Association of Physicians of India, vol.40, no.6, pp. 390-391,1992. View at Scopus
3. S.R.Pal, N.L.Chitkara, S.Choudhary, D.V.Dutta, S.D.Deodhar, and P.N.Chhuttani, "Hepatitis B virus infection in Northern India.Prevalence,subtypes, and seasonal variation," Bulletin of the World Health Organization, vol.51, no.1, pp.13-17,1974. View at Scopus
4. V.N.Mital, O.P.Gupta, D.K.Nigam, P.C.Saxena, and S. Kumar, "Pattern of hepatitis B antigen-contact and carrier state in Northern India," Journal of the Indian Medical Association, vol.74,no.6, pp. 105-107, 1980.View at Scopus
5. O.Sobeslavsky, "Prevalence of markers of hepatitis B virus infection in various countries: a WHO collaborative study," Bulletin of the World Health Organization, vol.58,no.4,pp.621-628,1980. View at Scopus

6. B. N. Tandon, M.Irshad, M.Raju, G.P.Mathur, and M.N.Rao, "Prevalence of HBsAg and anti-HBs in children and strategy suggested for immunization in India," *Indian Journal of Medical Research A*, vol.93,pp.337-339,1991/View at Scopus
7. Tiwari BR, Ghimmire P, Karki S, Raj Kumar M,2008.Seroprevalence of human immunodeficiency virus in Nepalese blood donors: A study from three regional blood transfusion services. *Asian Journal of Transfusion Science*,2:66-68.
8. Pahuja S, Sharma M, Baitha B, Jain M Prevalence and trends of markers of hepatitis C virus, hepatitis B virus and human immunodeficiency virus in Delhi blood donors. A hospital based study. *Jpn J Inf Dis* 2007;60:389-391
9. Leena MS, Mohd. Shafee: Trend and prevalence of transfusion transmitted infections among blood donors in rural teaching institute, south India: *Journal of Pathology of Nepal* 2012, vol.2,203-206
10. Siddiqui FA, Akhtar K, Sherwani RK, Rehman K, Alam F, Ansari A. prevalence of Hepatitis C virus in Aligarh: A seven year experience. *Indian J Comm Med* 2009; 34:264-5
11. Sood S, Malvankar S.Seroprevalence of Hepatitis B Surface Antigen, Antibodies to the Hepatitis Virus, and Human Immunodeficiency Virus in a Hospital-Based Population in Jaipur, Rajasthan.*Indian J Comm Mede* 2010;35:165-8.
12. Srikrishna A, Sitalakshmi S, Damodar P. How safe are our safe donors? *Indian J. Pathol Microbiol* 1999;42:411-6
13. Makroo RN, Salil P, Vashist RP,Shivlal. Trend of HIV infection in the blood donors of Delhi. *Indian J.Pathol Microbiol* 1996;39:139-42.
14. Kurl A,Berry V,Dhanoa J,Manish A.Seropositivity of HBsAg,Anti HCV and Anti HIV among blood donors : A comparative study on three years of 5 years interval.*Indian J Pub Health* 2007;51:41-2.
15. Adhikari L, Bhatta D, Tsering DC, Sharma DK, Pal R, Gupta A. Infectious disease markers in blood donors at Central Referral Hospital,Gangtok,Sikkim.*Asian J Transf Sci* 2010;4:41-2.
16. Bhattacharya P1, Chandra PK, Datta S, Banerjee A, Chakraborty S, Rajendran K, Basu SK, Bhattacharya SK, Chakravarty R. .Significant increase in HBV, HCV, HIV and syphilis infections among blood donors in West Bengal, Eastern India 2004-2005: exploratory screening reveals high frequency of occult HBV infection. *World J Gastroenterol* 13:3730-33
17. Chandra T, Kumar A, Gupta A (2009) Prevalence of transfusion transmitted infections in blood donors: an Indian experience. *Trop Doct* 39:152-154 *Indian J Hematol Blood Transfus* (Jan-Mar 2011)27(1):1-65
18. Srikrishna A, Sitalakshmi S, Damodar P (1999) How safe are our donors.*Garg S, Mathur DR, Gard DK (2001) Comparison of*

seropositivity of HIV,HBV,HCV and syphilis in  
replacement and voluntary 44:409-412

**Table 1 : Year & Gender wise distribution of blood donors**

Year	Voluntary Donors			Replacement donors			TOTAL
	M	F	TOTAL (Voluntary)	M	F	TOTAL (Replacement)	Total Blood Donors (Both Groups)
2013	6980	1290	8270	3047	668	3715	11,985
2014	7735	1933	9668	3556	627	4183	13,851
GRAND TOTAL	14,715	3,223	17,938	6,603	1,295	7,898	25,836

**Table 2 : Year Wise Trends of Seroprevalence of TTIs:**

INFECTIONS	Year – 2013	Year – 2014
HBV	1.78%	2.10%
HCV	0.12%	0.18%
RPR(Syphilis)	0.25%	0.33%

**Table 3 : Distribution of sero-positive cases in Voluntary vs. Replacement donors**

Infections	Voluntary donors (Total no.17,938)	Replacement donors (Total no.7,898)	TOTAL (Total no.25,836)
HBV	(170)0.95%	(78)0.99%	(248)1.94%
HCV	(20)0.11%	(15)0.19%	(35)0.30%
RPR	(25)0.14%	(11)0.15%	(36)0.29%

**Table 4 : TTI prevalence in India**

Place	HBsAg %	HCV %	SYPHILIS%	Reference
Ludhiana	0.66	1.09	0.85	Gupta N. et al(2004) 12
Delhi	2.23	0.66		Pahuja S et al(2007)16
Lucknow(UP)	1.96	0.85	0.01	Chandra T et al (2009) 17
Southern Haryana	1.7	1.0	0.9	Arora D et al (2010)
West Bengal	1.46	0.31	0.72	Bhattacharya P et al (2007)
Bangalore, Karnataka	1.86	1.02	1.6	Srikrishna A et al (1999)18
Present study	1.94	0.15	0.29	(2013-14)